Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
	)	
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112
	)	
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95

COMMENTS OF THE
CONSUMER TECHNOLOGY ASSOCIATION

The Consumer Technology Association ("CTA")[1] respectfully submits these comments in response to the above-captioned *Second Further Notice of Proposed Rulemaking* ("*Second*

[1] Consumer Technology Association (CTA)™ is the trade association representing the $351 billion U.S. consumer technology industry, which supports more than 15 million U.S. jobs. More than 2,200 companies – 80 percent are small businesses and startups; others are among the world's best known brands – enjoy the benefits of CTA membership including policy advocacy, market research, technical education, industry promotion, standards development and the fostering of business and strategic relationships. CTA also owns and produces CES® – the

Further Notice").[2] CTA applauds the Commission for taking further steps to facilitate innovative use of millimeter wave ("mmW") spectrum that will, among other things, support the development of Fifth Generation ("5G") wireless services. By making mmW spectrum available on a lightly licensed and unlicensed basis, the Commission is enabling the kind of permissionless innovation that has made and will continue to make the U.S. the world leader in wireless services and technology.

I. INTRODUCTION

5G will enable a wide range of consumer technologies from spectrum-hungry broadband video programming to micro-signals for Internet of Things ("IoT") devices and everything in between. These next generation services and applications will improve consumers' lives, make industry more efficient, power smarter cities and government, foster American leadership, and create new jobs. For example, while today's technologies already are enabling positive health outcomes unimaginable even a decade ago,[3] emerging consumer health and wellness applications can go even further with 5G. As just one example, with 5G's ultra-low latency, a doctor will be able to "feel" a patient's body in a remote operating room using real-time sensors and haptic interfaces.[4]

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world's gathering place for all who thrive on the business of consumer technologies. Profits from CES are reinvested into CTA's industry services.

[2] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, FCC 17-152 (2017). CTA refers herein to ¶¶ 15-89 as the "*Second Report and Order*" and ¶¶ 90-109 as the "*Second Further Notice*."

[3] *See, e.g.*, Comments of the Consumer Technology Association, GN Docket No. 16-46, at 2-4 (May 24, 2017) (discussing the emerging applications that improve safety monitoring for seniors, provide tools for sleep and health monitoring, and allow for remote diagnosis and video conferencing with a doctor).

[4] *See* Gary Arlen, *The Promise of 5G*, CTA's It Is Innovation (i3) Magazine (Aug. 22, 2017) https://www.cta.tech/News/i3/Articles/2017/July-August/The-Promise-of-5G.aspx.

CTA's member companies are accelerating industry efforts to deliver on 5G. For example, U.S. mobile carriers, with device manufacturers, have conducted real-world trials of 5G technology, and just last month the Third Generation Partnership Project adopted the first 5G specification.[5] When these networks go live, they will become catalysts for innovation across the entire U.S. economy and deliver immediate benefits to consumers through enhanced mobile broadband.

As the Commission has recognized, it is essential to ensure that this positive momentum towards 5G continues. The agency can do so by taking three of the actions addressed in the *Second Further Notice*:

- Make more spectrum available for mobile and other innovative uses while also providing a roadmap setting forth timing for release of spectrum in the pipeline;[6]
- Consider whether adopting multiple safe harbor benchmarks is the best approach for build-out or whether to adopt other performance requirements for mmW spectrum bands; and
- Clarify its proposed operability requirement for devices operating in the 24 GHz band.

Through these actions, the Commission will build on early actions in this proceeding to facilitate the development of 5G technology.

II. MAKING MORE SPECTRUM AVAILABLE NOW AND PROVIDING CLARITY REGARDING TIMING OF AVAILABILITY FOR SPECTRUM IN THE PIPELINE WILL CONTINUE TO FUEL THE MOMENTUM OF 5G

One of the keys to 5G's game-changing capabilities is the use of a wide array of spectrum bands including mmW frequencies. Future generations of fixed and mobile services will involve multiple spectrum bands, with the network employing the most appropriate frequencies for the

[5] *See, e.g.*, Corinne Reichert, *Samsung and Cisco build 5G Verizon trial network*, ZDNet (May 11, 2017), http://www.zdnet.com/article/samsung-and-cisco-build-5g-verizon-trial-network; Monica Alleven, *3GPP Declares First 5G NR Spec Complete*, Fierce Wireless (Dec. 20, 2017), https://www.fiercewireless.com/wireless/3gpp-declares-first-5g-nr-spec-complete.

[6] As further discussed herein, this roadmap should include dates in the near term for holding spectrum auctions.

best delivery of a particular service. Making mmW spectrum available on a lightly licensed and unlicensed basis while also providing a roadmap for the release of spectrum in the pipeline are key to sustaining the momentum for developing and deploying 5G networks.

The Commission can take a big step in the right direction by adopting pending proposals to include the 32 GHz, 42 GHz, and 50 GHz bands in the Upper Microwave Flexible Use Service ("UMFUS"), allowing licensees to provide any combination of mobile and fixed services.[7] The demand for bandwidth is expected to explode in the coming years. 5G will support applications that depend on very high speed and low latency communications services. These applications will benefit from 5G's increased data capacities and will support broad uses such as machine-to-machine communications and IoT applications.[8] For example, "[t]o address critical city functions, such as smart health care, smart infrastructure management and smart mobility, the city's mission-critical control nerve centers will require high reliability, a very low latency for response rates and data security."[9] In turn, applications for smart cities and connected living will further drive increased mobile data traffic and backhaul demands.

As CTA previously has noted, the mmW bands hold promise for meeting demand in heavily congested areas and can be one tool (of many) to alleviate the spectrum crunch.[10] This is particularly so in those places where traffic demands will be highest, such as smart cities.

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[7] *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8145 ¶ 373 (2016) ("*Further Notice*") (proposing to authorize flexible use licenses in the 32 GHz, 42 GHz, and 50 GHz bands); *Second Report and Order* n.35 ("We will not act on the 32 GHz, 42 GHz, or 50 GHz bands at this time.").

[8] *See* Consumer Technology Association, *Development and Deployment of 5G Network*, at 37 (Oct. 2017) ("*CTA Network Study*").

[9] *Id.* at 14.

[10] Comments of the Consumer Technology Association f/k/a Consumer Electronics Association, GN Docket No. 14-177 et al., at 3-4 (Sept. 30, 2016) ("CTA Further Notice Comments").

Indeed, operating at higher frequencies could "open up new opportunities and reduce current overcrowding."[11] To ensure that adequate spectrum is available for the innovation that 5G is expected to enable, CTA urges the Commission to continue to find new and innovative ways to make mmW spectrum available under flexible use policies and, in near term, adopt pending proposals to include the 32 GHz, 42 GHz, and 50 GHz bands in the UMFUS.

The Commission can further help industry continue to develop new and innovative 5G services and products by issuing a roadmap describing the timing related to the release of spectrum in the pipeline including dates, in the near term, for holding spectrum auctions.[12] A roadmap will provide the consumer technology industry the clarity necessary to plan for commercial development and deployment of 5G products and services that will use new spectrum bands, and projected timing will ensure that products and services are ready when these bands are released.[13]

As CTA previously has noted, 5G will not be accomplished with mmW spectrum alone.[14] Rather, access to a range of spectrum bands – low, mid, and high – will be necessary. For the consumer technology industry to develop innovative products and services, it must have an accurate understanding of when particular spectrum bands will be available for commercial use. 5G networks, and the services and products they support, may be delayed if innovators are left in the dark about the Commission's plans for the release of spectrum in the pipeline or if the auctions that make these additional spectrum bands available for commercial use do not occur in the near term.

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[11] *CTA Network Study* at 13.

[12] *Id.* at 26 (calling for the FCC to "[p]rovide a roadmap for spectrum release in the pipeline").

[13] *Id.* at 34.

[14] *See* CTA Further Notice Comments at 2 (noting that "5G-level service will require use of additional frequency bands" multiple frequency bands, including "lower band mobile spectrum"); *see also CTA Network Study* at 26 (noting that 5G deployments will occur in the mmW spectrum bands as well as the mid-range and lower-range bands).

III. MULTIPLE SAFE HARBOR BENCHMARKS FOR BUILD-OUT AND OTHER FLEXIBLE PERFORMANCE REQUIREMENTS ENCOURAGE INNOVATION

Build-out or other performance requirements should provide flexibility for innovation while reflecting the strengths and weaknesses of these spectrum bands.[15] One way to provide flexibility is to recognize multiple safe harbor performance benchmarks. The performance requirement should reflect that the shorter waves in the mmW bands require a much greater density of base stations – density that would be present in urban areas – than mobile broadband at the lower spectrum bands. Furthermore, while 5G business models will include geographically widespread services of mobile carriers, they also will include geographically targeted services of other providers, or that are self-provisioned. The Commission correctly identifies that the traditional performance metric population coverage may be ill-fit for an IoT-type service.[16]

IV. THE COMMISSION SHOULD APPLY AN OPERABILITY REQUIREMENT TO DEVICES OPERATING IN THE 24 GHZ BAND

The Commission correctly recognizes the necessity of applying an "operability" requirement to devices operating in the 24 GHz band, *i.e.*, a rule mandating that any equipment capable of operating anywhere within the 24 GHz band be capable of operating across the entire 24 GHz band.[17] The Commission should expressly clarify that this operability requirement is specific to the 24 GHz band, and does not require equipment capable of operating on the 24 GHz band to operate on any other UMFUS bands. In addition, the Commission should clarify that it is not adopting an *interoperability* requirement, which in this proceeding "refer[s] to equipment

[15] *See Second Further Notice* at ¶¶ 99-104 (seeking comment on possible performance requirements for IoT or other innovative uses of UMFUS licenses).

[16] *Further Notice*, 31 FCC Rcd at 8174-75 ¶¶ 467-69; *Second Further Notice* at ¶ 99.

[17] *Second Further Notice* at ¶ 108.

capable of operating across multiple technologies or air interfaces."[18] As CTA previously has noted, such a requirement could present challenges for equipment manufacturers seeking to develop technologies for bands that may have different requirements corresponding to their license type, especially in bands subject to a sharing regime.[19]

V. CONCLUSION

CTA's member companies are working hard to ensure that the ever-increasing consumer demand for high-speed wireless connectivity is met through new products and services. The mmW spectrum holds promise as a part of the solution to meeting that demand, and CTA looks forward to working with the FCC to fully evaluate and take advantage of the opportunities presented by the mmW bands.

Respectfully submitted,

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[18] *Id.* n.260.

[19] CTA Further Notice Comments at 6-7.